

EXAMINATION 1 VERSION B
"Competitive Supply and Demand"
September 22, 2021

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators, calculators with alphabetical keyboards, cell phones, and wireless devices are NOT permitted. Numerical answers, if rounded, must be correct to at least 3 significant digits. Point values for each question are noted in brackets. Maximum total points are 100.

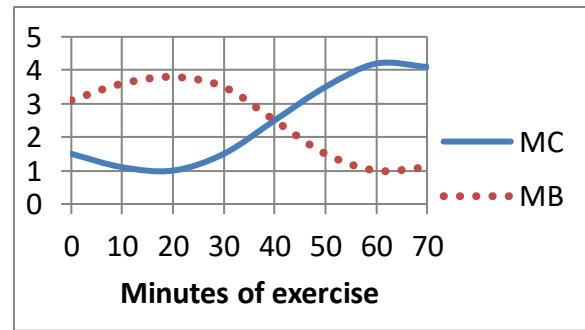
I. Multiple choice: Please circle the one best answer to each question. [1 pt each, 28 pts total]

- (1) In economics, *rational behavior* means
- using math to make decisions.
 - making sacrifices today for a better future.
 - maximizing one's income.
 - ignoring "soft" concerns like friendships and charity.
 - doing the best one can with what one has.

- (2) Brian buys a ticket to a concert for \$50. When he arrives at the venue, he discovers that scalpers are willing to pay \$75 for his ticket. His *opportunity cost* of attending the concert is
- \$0.
 - \$25.
 - \$50.
 - \$75.

- (3) Your *marginal benefit* of eating strawberries is
- the benefit of the first strawberry you eat.
 - the total benefit of all strawberries you eat.
 - the average benefit of all strawberries you eat.
 - the benefit of the last strawberry you eat.

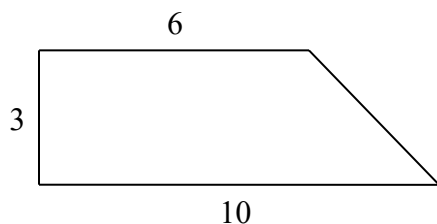
- (4) The graph below shows Amy's marginal cost (MC) and marginal benefit (MB) from cardio exercise at the gym. Amy's rational choice is to exercise for
- 20 minutes.
 - 40 minutes.
 - 50 minutes.
 - 60 minutes.
 - 70 minutes.



- (5) In economics, an *equilibrium* is a situation where
- inflation equals zero percent.
 - economic growth is zero.
 - total costs equal total benefits.
 - no one wants to change their choices.
- (6) "The unemployment rate is 5.2 percent" is an example of
- a positive statement.
 - a normative statement.
 - both of the above.
 - none of the above.

(7) The area of the trapezoid below equals

- a. 18.
- b. 24.
- c. 30.
- e. 60.
- f. 180.



(8) Economic or physical capital includes

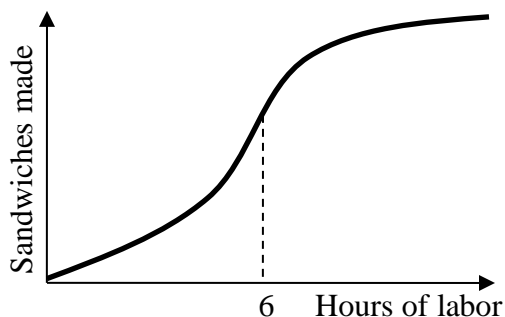
- a. trucks and bulldozers.
- b. machinery and equipment.
- c. factories and office buildings.
- d. all of the above.
- e. none of the above.

(9) A production function shows the relationship between the

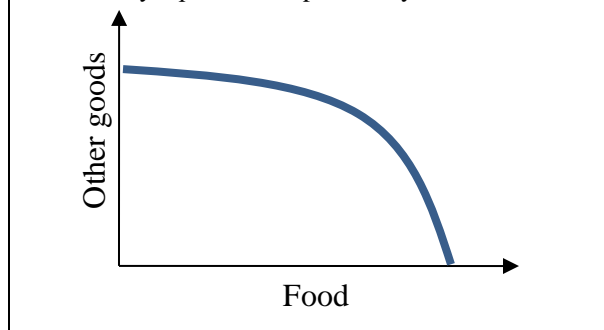
- a. quantity of input and the quantity of output.
- b. current level of output and the past level of output.
- c. level of output and the level of demand for output.
- d. price of output and the quantity produced.

(10) Is the production function below characterized by diminishing returns to labor input?

- a. Yes, for all levels of labor input.
- b. No, not for any levels of labor input.
- c. Yes, but only after 6 hours of labor input.
- d. Yes, but only before 6 hours of labor input.



The next two questions refer to the following graph of a country's production-possibility curve.



(11) By definition, what is held constant along this production-possibility curve?

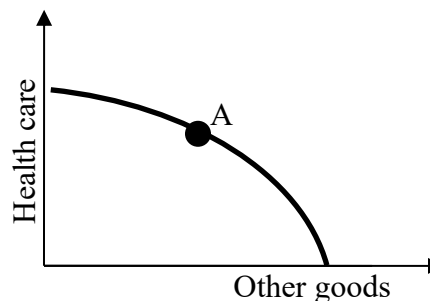
- a. The country's total inputs.
- b. The prices of food and other goods.
- c. Output of food.
- d. Output of other goods.
- e. All of the above.

(12) As more food is produced, the opportunity cost of the last unit of food

- a. remains constant.
- b. decreases.
- c. increases.
- d. first increases, then decreases.

(13) The graph below shows the production possibility curve for some country. The combination of outputs represented by point A

- a. is feasible and efficient.
- b. is feasible but not efficient.
- c. is infeasible.
- d. cannot be determined from information given.



(14) Suppose Farmer A's opportunity cost of producing a bushel of corn is 1/2 bushel of soybeans, but Farmer B's opportunity cost of producing a bushel of corn is 1/3 bushel of soybeans. Which farmer has a comparative advantage in producing corn?

- a. Farmer A.
- b. Farmer B.
- c. both farmers.
- d. neither farmer.

(15) Monetary exchange is more common today than bartering because

- a. bartering is often illegal whereas anything can be legally bought and sold with money.
- b. bartering is a lost art.
- c. monetary exchanges are subject to less tax.
- d. bartering requires a "double coincidence of wants."

(16) The *law of one price* means that

- a. the prices of different goods—like cell phones and bicycles—will gradually converge to each other.
- b. each buyer will pay her or his own price.
- c. each buyer will pay only once for a good.
- d. all buyers will pay roughly the same price.

(17) The *law of demand* means that

- a. the quantity that buyers want to buy is negatively related to the price.
- b. demand curves are necessarily straight lines.
- c. buyers will pay whatever price is necessary to purchase the good.
- d. the number of buyers must equal the number of sellers.

(18) *Ceteris paribus* is a Latin phrase meaning

- a. "comparative advantage."
- b. "the Law of One Price."
- c. "assuming rational behavior."
- d. "holding other things constant."

(19) A movement along the demand curve for cars caused by a change in the price of cars is called a

- a. change in marginal product.
- b. change in property rights.
- c. change in demand for cars.
- d. change in the quantity demanded of cars.

(20) A fall in the in the price of chips will shift the demand for salsa to the right, assuming chips and salsa are

- a. complementary goods.
- b. substitute goods.
- c. normal goods.
- d. inferior goods.

(21) A rise in people's incomes will shift the demand for Ramen noodles to the left, if Ramen noodles are

- a. a complementary good.
- b. a substitute good.
- c. a normal good.
- d. an inferior good.

(22) The *law of supply* means

- a. a legal regulation that applies to sellers.
- b. there is always someone willing to sell a product.
- c. the quantity that sellers want to produce and sell is positively related to the price.
- d. sellers can charge whatever price they want.

(23) Spaghetti sauce is made from tomatoes, so if the price of tomatoes falls, then the

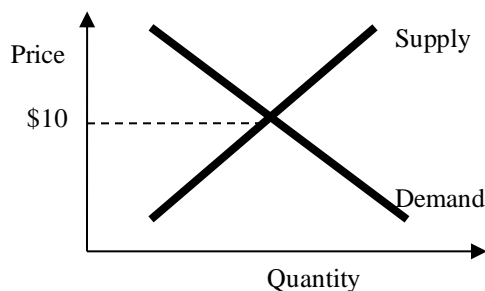
- a. demand for spaghetti sauce will shift left.
- b. demand for spaghetti sauce will shift right.
- c. supply of spaghetti sauce will shift left.
- d. supply of spaghetti sauce will shift right.

(24) If a new, more efficient method for growing rice is developed, then

- a. demand for rice will shift left.
- b. demand for rice will shift right.
- c. supply of rice will shift left.
- d. supply of rice will shift right.

(25) Consider the supply-and-demand diagram below. If for some reason the price were \$15, then

- a. the price would fall.
- b. the price would rise.
- c. the demand curve would shift left.
- d. the supply curve would shift right.



(26) In September, the price of pears decreases and the quantity sold increases. This could be caused by

- a. rightward shift in the demand for pears.
- b. rightward shift in the supply of pears.
- c. leftward shift in the demand for pears.
- d. leftward shift in the supply of pears.

(27) Brandon is willing to pay \$600 for an iPad, but fortunately the price is only \$400. If he buys an iPad, his consumer surplus is

- a. zero.
- b. \$200.
- c. \$400.
- d. \$600.
- e. \$1000.

(28) At any point on the supply curve for wheat, the height of the supply curve equals

- a. marginal cost of producing that bushel of wheat.
- b. producer surplus on that bushel of wheat.
- c. consumer surplus on that bushel of wheat.
- d. consumers' willingness to pay for that bushel of wheat.

II. Problems: Insert your answer to each question in the box provided. Use margins and graphs for scratch work. Only the answers in the boxes will be graded. Work carefully—partial credit is not normally given for questions in this section.

(1) [Percent change, midpoint formula: 2 pts] Suppose the average price of a sandwich in Des Moines is \$6 and the average price in Chicago is \$10. Compute the percent difference using the midpoint method.

%

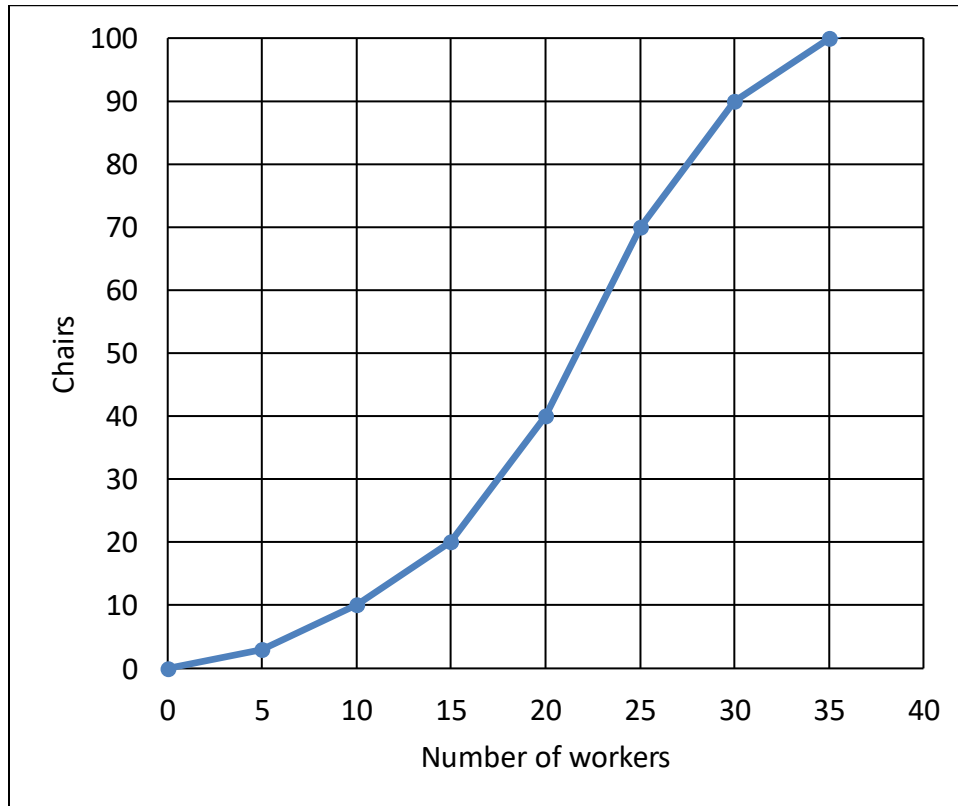
(2) [Percent change of product: 4 pts] Consumer spending on electricity equals the price paid times the quantity purchased. Suppose the price of electricity increases by 5 percent and the quantity purchased decreases by 2 percent.

a. Does spending on electricity *increase* or *decrease*?

%

b. By approximately how much?

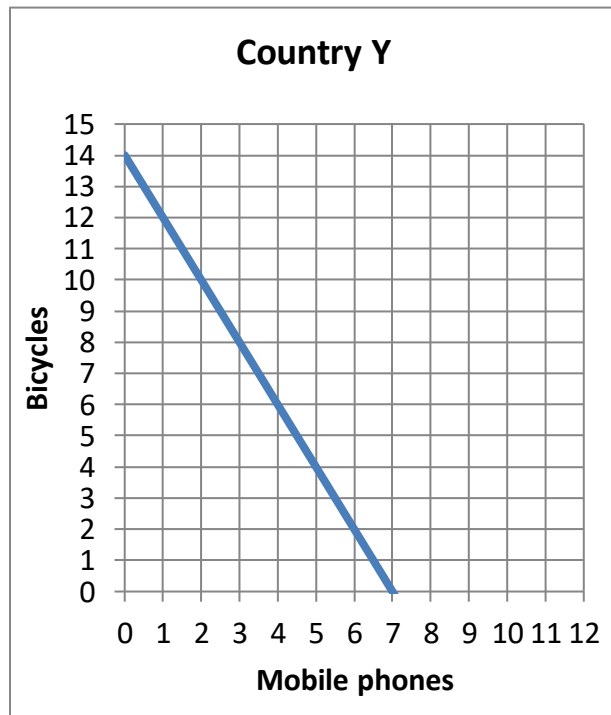
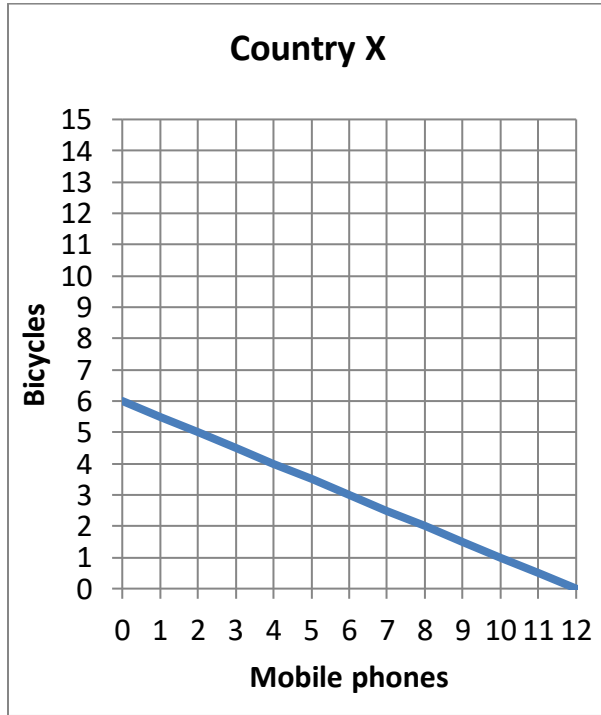
(3) [Production functions: 8 pts] Acme Chair Company has the hourly production function shown below.



- a. If the company employs 20 workers, what is their average product?
- b. If the company employs 10 workers, what is their average product?
- c. What is the marginal product of workers, as the number of workers increases from 15 to 20?
- d. What is the marginal product of workers, as the number of workers increases from 30 to 35?

chairs per worker
chairs per worker
chairs per worker
chairs per worker

(4) [Comparative advantage, gains from trade: 17 pts] Country X and Country Y can each produce bicycles and mobile phones. They each face a tradeoff between these two products because of limited workforces. Their production possibility curves are shown below.



- What is Country X's opportunity cost of producing a phone?
- What is Country Y's opportunity cost of producing a phone?
- What is Country X's opportunity cost of producing a bicycle?
- What is Country Y's opportunity cost of producing a bicycle?
- Which country has a comparative advantage in producing phones?
- Which country has a comparative advantage in producing bicycles?

	bicycles
	bicycles
	phones
	phones

g. [3 pts] Fill in the blanks: *Both* countries can consume combinations of products *outside* their individual production possibility curves if _____ exports *two* bicycles to _____, which exports _____ phones in return.

h. **Plot** the trade that you propose in part (g) on the graphs above. For each country, plot and label the starting point representing **production before trade**, and the ending point representing **consumption after trade**.

(5) [Shifts in demand and supply: 15 pts] Analyze each of the following markets according to the accompanying imaginary scenario.

a. Consider the market for **natural gas**. Suppose we have an unusually cold winter. (Most homes in the Midwest are heated with natural gas.)

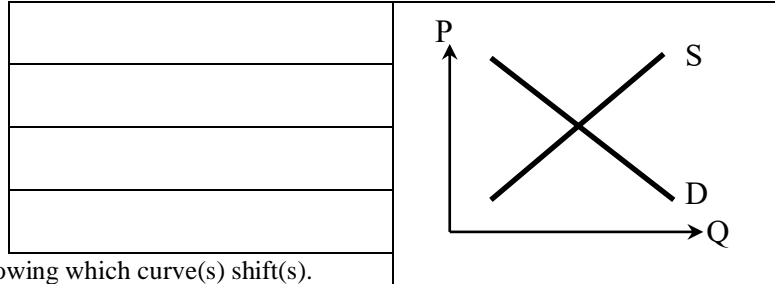
Does demand shift *left*, shift *right*, or remain *unchanged* ?

Does supply shift *left*, shift *right*, or remain *unchanged* ?

Does the equilibrium price *increase*, *decrease*, or *cannot be determined* ?

Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined* ?

Sketch a graph of this scenario at right, showing which curve(s) shift(s).



b. Consider the market for **computers**: Suppose the price of computer components rises due to COVID-related disruptions.

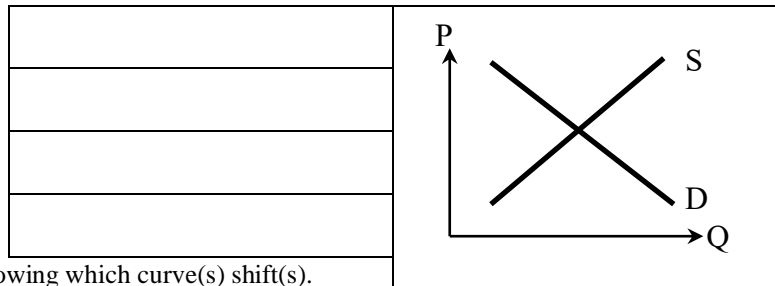
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Does the equilibrium price *increase*, *decrease*, or *cannot be determined* ?

Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined* ?

Sketch a graph of this scenario at right, showing which curve(s) shift(s).



c. Consider the market for **blueberries**: A new government study reports that eating blueberries helps fight cancer and heart disease. At the same time, new environmental regulations raise the cost of growing blueberries.

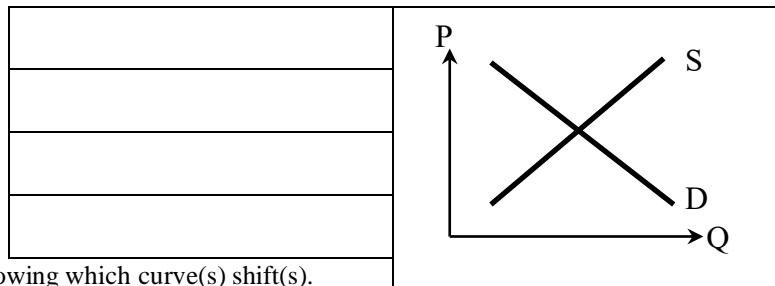
Does demand shift *left*, shift *right*, or remain *unchanged* ?

Does supply shift *left*, shift *right*, or remain *unchanged* ?

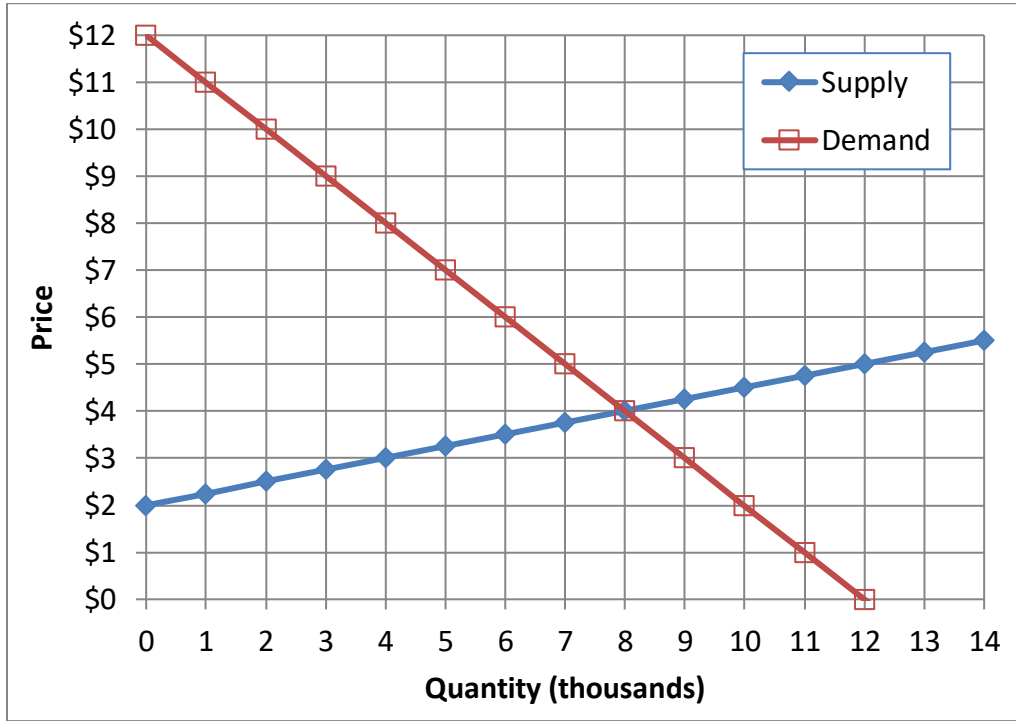
Does the equilibrium price *increase*, *decrease*, or *cannot be determined* ?

Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined* ?

Sketch a graph of this scenario at right, showing which curve(s) shift(s).



(6) [Consumer surplus, producer surplus: 22 pts] The market for sub sandwiches is depicted in the graph below.



Suppose the price in this market were \$5 for some unknown reason.

- a. Would there be *excess demand*, *excess supply*, or *neither*?
- b. How much?
- c. Would the price tend to *rise*, *fall*, or remain *constant*?

thousand

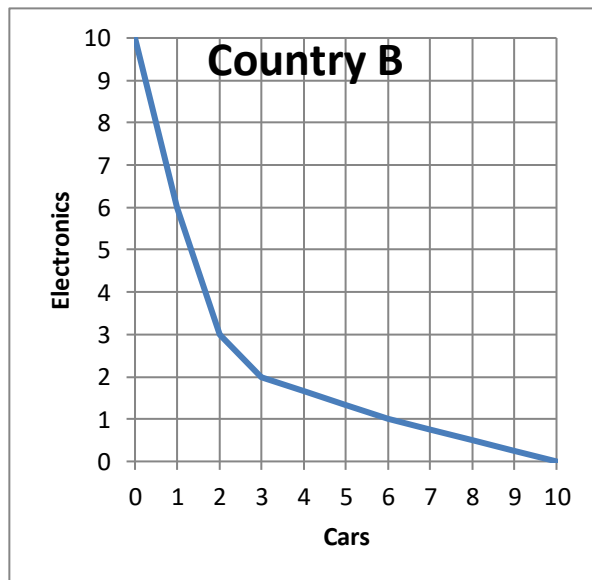
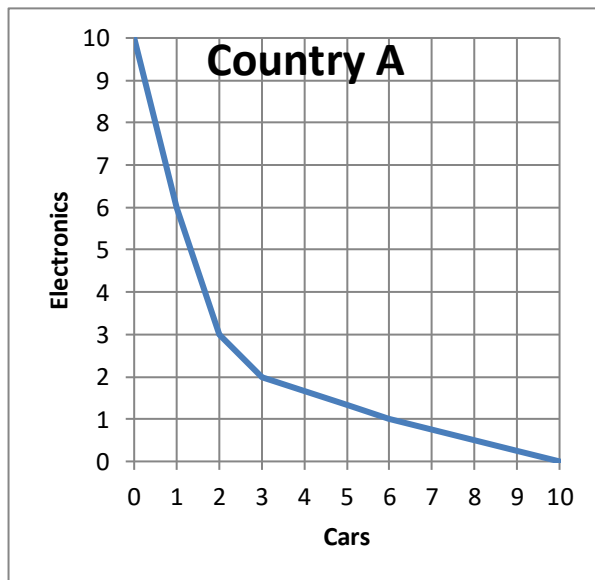
Now suppose the market is in *equilibrium*.

- d. What is the equilibrium price?
- e. What is the equilibrium quantity?
- f. How much are consumers willing to pay for the 3 thousandth sandwich?
- g. How much consumer surplus do they enjoy for the 3 thousandth sandwich?
- h. What is the marginal cost to producers of the 4 thousandth sandwich?
- i. How much producer surplus do they enjoy for the 4 thousandth sandwich?
- j. Compute total consumer surplus.
- k. Compute total producer surplus.

\$
thousand
\$
\$
\$
\$
\$
\$ thousand
\$ thousand

III. Critical thinking: Write a one-paragraph essay answering the question below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling. [4 pts]

- (1) In this course, we have emphasized gains from trade based on *differences* in production possibility curves. Now consider the PP curves of two countries shown below, which are *identical*. Can both countries enjoy combinations of goods outside their individual PP curves through trade? If you answer NO, explain why not. If you answer YES, state verbally an example of a trade that puts both countries outside their individual PP curves, and plot that trade on the graphs.



[end of exam]